MAIL TO:

STATE OF UTAH
DIVISION OF PURCHASING
3150 STATE OFFICE BUILDING, CAPITOL HILL
P.O. BOX 141061
SALT LAKE CITY, UTAH 84114-1061
TELEPHONE (801) 538-3026
http://purchasing.utah.gov

Invitation to Bid

Solicitation Number: **PM6014**

Due Date: **09/07/05 at 2:00 PM**

Date Sent: August 19, 2005

Goods and services to be purchased: **Peck Field Drainage - Contour Athletic Field and Install Drainage System**

Must Complete

Company Name		Federal Tax Identification Number	
Ordering Address	City	State	Zip Code
Remittance Address (if different from ordering address)	City	State	Zip Code
Type ☐ Corporation ☐ Partnership ☐ Proprietorship ☐ Government	Company Contact Person		
Telephone Number (include area code)	Fax Number (include area code)		
Company's Internet Web Address	Email Address		
Discount Terms (for bid purposes, bid discounts less than 30 days will not be considered)	Days Required for Delivery After Receipt of Order (see attached for any required minimums)		

The following documents are included in this solicitation: Solicitation forms, instructions and general provisions, Terms and Conditions, and specifications. Please review all documents carefully before completing.

The undersigned certifies that the goods or services offered are produced, mined, grown, manufactured, or performed in Utah. Yes_____ No_____. If no, enter where produced, etc._____

Contractor License Number	Contractor License Expiration Date	Contractor Class Title	Contractor Class Number

CONTRACTOR MUST BE A LICENSED CONTRACTOR IN THE STATE OF UTAH TO BID FOR THIS PROJECT. SEE WWW.PURCHASING .UTAH.GOV CURRENT BIDS CONTRACTOR CLASSIFICATION FOR CURRENT CLASSIFICATION CODES.

Offeror's Authorized Representative's Signature	Date
Type or Print Name	Position or Title

STATE OF UTAH
DIVISION OF PURCHASING

Invitation to Bid

Solicitation Number: PM6014

Due Date: 09/07/05

Vendor Name:

Item #	Qty.	Unit	Description	Total Price
001	1.00	Job	Peck Field Drainage - Contour Athletic Field and Install Drainage System per plans and specifications	

THIS IS A FORMAL BID, THEREFORE NO FAXED RESPONSES WILL BE ACCEPTED

REQUIREMENTS

A pre-bid meeting will be held on Wednesday August 31 at 9:00 am and at 1:00 pm. Bidders are to meet in building 119 at Camp Williams. **Attendance at one of the meetings is mandatory**. **Remember to sign attendance log. Non-attendance will deem your bid as non-responsive.**

Project to be completed by November 30, 2005

BONDS:

A 5% bid bond will be required at the time of bid submission and a 100% performance/payment bond will be required of the successful bidder. **A completed bond statement must be submitted with each bid.**

CHANGES OR MODIFICATIONS TO PROCUREMENT:

Any modification to this procurement effort shall be made in writing by addendum issued by the state division of purchasing. Only authorized and properly issued addenda shall constitute the official position of the state and shall be binding. Anyone submitting a response to this solicitation, with basis in or on other communication or information received from sources other than through official addendum, assumes full risk including the possibility of a determination of non-responsiveness and may be rejected at the sole discretion of the state.

QUESTIONS:

Questions on project details contact: Kent Barlow (801) 253-5427.

For bid processing questions, please contact Paul Mash at 801-538-3138

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Reference: RX 190 76000000002
Commodity Code: 91345

INVITATION TO BID - INSTRUCTION AND GENERAL PROVISIONS

1. BID PREPARATION: (a) All prices and notations must be in ink or typewritten. (b) Price each item separately. Unit price shall be shown and a total price shall be entered for each item bid. Errors may be crossed out and corrections printed in ink or typewritten adjacent and must be initialed in ink by person signing quotation. (c) Unit price will govern, if there is an error in the extension. (d) Delivery time is critical and must be adhered to as specified. (e) Wherever in this document an item is defined by using a trade name of a manufacturer and/or model number, it is intended that the words, "or equivalent" apply. "Or equivalent" means any other brand that isequal in use, quality, economy and performance to the brand listed as determined by the Division of Purchasing & General Services (DIVISION). If the vendor lists a trade name and/or catalog number in the bid, the DIVISION will assume the item meets the specifications unless the bid clearly states it is an alternate, and describes specifically how it differs from the item specified. All bids must include complete manufacturer's descriptive literature if quoting an equivalent product. All products are to be of new, unused condition, unless otherwise requested in this solicitation. (f) By signing the bid the vendor certifies that all of the information provided is accurate, that they are willing and able to furnish the item(s) specified, and that prices quoted are correct. (g) This bid may not be withdrawn for a period of 60 days from bid due date.

2. SUBMITTING THE BID: (a) The bid must be signed in ink, sealed in a properly addressed envelope, and delivered to the DIVISION OF PURCHASING (DIVISION), 3150 State Office Building, Capitol Hill, Salt Lake City, UT 84114-1061 by the "Due Date and Time." **The "Bid Number" and "Due Date" must appear on the outside of the envelope.** (b) Bids, modifications, or corrections received after the closing time on the "Due Date" will be considered late and handled in accordance with the Utah Procurement Rules, section R33-3-109. (c) **Your bid will be considered only if it is submitted on the forms provided by the state. Facsimile transmission of bids to DIVISION will not be considered.** (d) All prices quoted must be both F.O.B. Origin per paragraph 1.(c) and F.O.B. Destination. Additional charges including but not limited to delivery, drayage, express, parcel post, packing, cartage, insurance, license fees, permits, costs of bonds, or for any other purpose must be included in the bid for consideration and approval by the DIVISION. Upon award of the contract, the shipping terms will be F.O.B. Destination with all transportation and handling charges paid by the Contractor, unless otherwise specified by the DIVISION.

3. SOLICITATION AMENDMENTS: All changes to thissolicitation will be made through written addendum only. Bidders are cautioned not to consider verbal modifications.

4. PROPRIETARY INFORMATION: Suppliers are required to mark any specific information contained in their bid which is not to be disclosed to the public or used for purposes other than the evaluation of the bid. Each request for nondisclosure must to be accompanied by a specific justification explaining why the information is to be protected. Pricing and service elements of any bid will not to be considered proprietary. Bids submitted may to be reviewed and evaluated by any persons at the discretion of the state.

5. SAMPLES: Samples of item(s) specified in this bid, when required by DIVISION, must to be furnished free of charge to DIVISION. Any item not destroyed by tests may, upon request made at the time the sample is furnished, to be returned at the bidder's expense.

6. WARRANTY: The contractor agrees to warrant and assume responsibility for all products (including hardware, firmware, and/or software products) that it licenses, contracts, or sells to the State of Utah under this contract for a period of one year, unless otherwise specified and mutually agreed upon elsewhere in this contract. The contractor (seller) acknowledges that all warranties granted to the buyer by the Uniform Commercial Code of the State of Utah applies to this contract. Product liability disclaimers and/or warranty disclaimers from the seller are not applicable to this contract unless otherwise specified and mutually agreed upon elsewhere in this contract. In general, the contractor warrants that: (1) the product will do what the salesperson said it would do, (2) the product will live up to all specific claims that the manufacturer makes in their advertisements, (3) the product will be suitable for the ordinary purposes for which such product is used, (4) the product will be suitable for any special purposes that the State has relied on the contractor's skill or judgement to consider when it advised the State about the product, (5) the product has been properly designed and manufactured, and (6) the product is free of significant defects or unusual problems about which the State has not been warned. Remedies available to the State include the following: The contractor will repair or replace (at no charge to the State) the product whose nonconformance is discovered and made known to the contractor in writing. If the repaired and/or replaced product proves to be inadequate, or fails of its essential purpose, the contractor will refund the full amount of any payments that have been made. Nothing in this warranty will be construed to limit any rights or remedies the State of Utah may otherwise have under this contract.

7. DIVISION APPROVAL: Purchase orders placed, or contracts written, with the state of Utah, as a result of this bid, will not to be legally binding without the written approval of the director of the DIVISION.

8. AWARD OF CONTRACT: (a) the contract will to be awarded with reasonable promptness, by written notice, to the lowest responsible bidder that meets the specifications. Consideration will to be given to the quality of the product(s) to be supplied, conformity to the specifications, the purpose for which required, delivery time required, discount terms and other criteria set forth in this invitation to bid. (b) The bids are opened publicly in the presence of one or more witnesses. the name of each bidder, and the amount of the bid is recorded. Each bid, and the record, is open to public inspection. (c) The DIVISION may accept any item or group of items, or overall low bid. the DIVISION has the right to cancel this invitation to bid at any time prior to the award of contract. (d) The DIVISION can reject any and all bids. And it can waive any informality, or technicality in any bid received, if the DIVISION believes it would serve the best interest of the State. (e) Before, or after, the award of a contract the DIVISION has the right to inspect the bidder's premises and all business records to determine the holder's ability to meet contract requirements. (f) DIVISION does not guarantee to make any purchase under awarded contract(s). Estimated quantities are for bidding purposes only, and not to be interpreted as a guarantee to purchase any amount. (g) Utah has a reciprocal preference law which will to be applied against bidders bidding products or services produced in states which discriminate against Utah products. For details see Section 63-56 20.5 -20.6, Utah Code Annotated.

9. ANTI-DISCRIMINATION ACT: The bidder agrees to abide by the provisions of the Utah Anti-discrimination Act, Title 34 Chapter 35, U.C.A. 1953, as amended, and Title VI and Title VII of the Civil Rights Act of 1964 (42 USC 2000e), which prohibit discrimination against any employee or applicant for employment, or any applicant or recipient of services, on the basis of race, religion, color, or national origin; and further agrees to abide by Executive Order No. 11246, as amended, which prohibits discrimination on the basis of sex; 45 CFR 90 which prohibits discrimination on the basis of age, and Section 504 of the Rehabilitation Act of 1973 or the Americans with Disabilities Act of 1990, which prohibits discrimination on the basis of disabilities. Also bidder agrees to abide by Utah's Executive Order, dated March 17, 1993, which prohibits sexual harassment in the workplace. Vendor must include this provision in every subcontract or purchase order relating to purchases by the State of Utah to insure that the subcontractors and vendors are bound by this provision.

10. DEBARMENT: The CONTRACTOR certifies that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction (contract) by any governmental department or agency. If the CONTRACTOR cannot certify this statement, attach a written explanation for review by the STATE.

11. ENERGY CONSERVATION AND RECYCLED PRODUCTS: The contractor is encouraged to offer Energy Star certified products or products that meet FEMP (Federal Energy Management Program) standards for energy consumption. The State of Utah also encourages contractors to offer products that are produced with recycled materials, where appropriate, unless otherwise requested in this solicitation.

12. GOVERNING LAWS AND REGULATIONS: All state purchases are subject to the Utah Procurement Code, Title 63 Chapter 56 U.C.A. 1953, as amended, and the Procurement Regulations as adopted by the Utah State Procurement Policy Board. These are available on the Internet at www.purchasing.utah.gov.

STATE OF UTAH ! DIVISION OF PURCHASING
3150 State Office Building, Salt Lake City, Utah 84114-1061 Telephone (801) 538-3026, Fax (801) 538-3882

PURCHASE ORDER CONTRACT: TERMS AND CONDITIONS

ACCEPTANCE OF THIS PURCHASE ORDER BINDS THE CONTRACTOR TO ALL THESE TERMS AND CONDITIONS AND ALL THE TERMS, CONDITIONS AND PROVISIONS INCLUDED IN THE SOLICITATION THE DIVISION OF PURCHASING OFFERED RELATING TO THIS PURCHASE ORDER.

1. **AUTHORITY:** Provisions of this Purchase Order are pursuant to the authority set forth in the Utah Procurement Code, 63-56, Utah Code Annotated (U.C.A.) 1953, as amended, and the Utah State Procurement Rules and Regulations. Any and all supplies, services and equipment furnished will comply fully with all applicable Federal and State laws and regulations.

2. **CONTRACT JURISDICTION, CHOICE OF LAW, AND VENUE:** The provisions of this Purchase Order shall be governed by the laws of the State of Utah. The parties will submit to the jurisdiction of the courts of the State of Utah for any dispute arising out of this Purchase Order or the breach thereof. Venue shall be in Salt Lake City, in the Third Judicial District Court for Salt Lake Co.

3. **CONFLICT OF INTEREST:** Contractor represents that none of its officers or employees are officers or employees of the State of Utah, unless disclosure has been made in accordance with 67-16-8, U.C.A., 1953, as amended. Further, Contractor certifies that it has not offered or given any gift or compensation prohibited by 67-16-5, U.C.A., 1953, as amended, to any officer or employee of the State of Utah to secure favorable treatment with respect to being awarded this Purchase Order.

4. **INDEPENDENT CONTRACTOR:** Contractor shall be an independent contractor, and as such shall have no authorization, express or implied to bind the State of Utah to any agreements, settlements, liability or understanding whatsoever, and agrees not to perform any acts as agent for the State, except as expressly set forth herein.

5. **INDEMNITY:** Contractor agrees to indemnify, save harmless and release the State of Utah, including all state officers, agents and employees from and against any and all loss, damages, injury, liability, suits and proceedings arising out of the performance of this contract by the Contractor, its officers, agents, volunteers, employees or subcontractors.

6. **EQUAL OPPORTUNITY CLAUSE:** Contractor agrees to abide by the provisions of the Utah Anti-discrimination Act, Title 34 Chapter 35, U.C.A., 1953, as amended, and Title VI and Title VII of the Civil Rights Act of 1964 (42 USC 2000e), which prohibit discrimination against any employee or applicant for employment, or any applicant or recipient of services, on the basis of race, religion, color or national origin and further agrees to abide by Executive Order No. 11246, as amended, which prohibits discrimination on the basis of sex; 45 CFR 90 which prohibits discrimination on the basis of age, and Section 504 of the Rehabilitation Act of 1973 or the Americans with Disabilities Act of 1990 which prohibits discrimination on the basis of disabilities. Also, Contractor agrees to abide by Utah's Executive Order, dated March 17, 1993 which prohibits sexual harassment in the workplace. Contractor must include this provision in every subcontract or purchase order relating to purchases by the State of Utah to insure that the subcontractors and vendors are bound by this provision.

7. **DEBARMENT:** The Contractor certifies that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction (contract) by any governmental department or agency. If the Contractor cannot certify this statement, attach a written explanation for review by the STATE.

8. **CANCELLATION OR REVISION:** This Purchase Order may be changed, revised or canceled only by the Division of Purchasing giving written notice to the Contractor.

9. **SALES TAX EXEMPTION**. The State of Utah's sales and use tax exemption number is **E33399**. The tangible personal property or services being purchased are being paid from State funds and used in the exercise of that entity's essential functions. If the items being purchased are construction materials, they will be converted into real property by employees of this government entity, unless sales tax is included as a separate line item on this purchase order.

10. **WARRANTY:** The Contractor agrees to warrant and assume responsibility for all products (including hardware, firmware, and/or software products) that it licenses, contracts, or sells to the State of Utah under this contract for a period of one year, unless otherwise specified and mutually agreed upon elsewhere in this contract. The Contractor (seller) acknowledges that all warranties granted to the buyer by the Uniform Commercial Code of the State of Utah apply to this contract. Product liability disclaimers and/or warranty disclaimers from the seller are not applicable to this contract unless otherwise specified and mutually agreed upon elsewhere in this contract. In general, the Contractor warrants that: (1) the product will do what the salesperson said it would do, (2) the product will live up to all specific claims that the manufacturer makes in their advertisements, (3) the product will be suitable for the ordinary purposes for which such product is used, (4) the product will be suitable for any special purposes that the State has relied on the Contractor's skill or judgment to consider when it advised the State about the product, (5) the product has been properly designed and manufactured, and (6) the product is free of significant defects or unusual problems about which the State has not been warned. Remedies available to the State include the following: The Contractor will repair or replace (at no charge to the State) the product whose nonconformance is discovered and made known to the Contractor in writing. If the repaired and/or replaced product proves to be inadequate, or fails of its essential purpose, the Contractor will refund the full amount of any payments that have been made. Nothing in this warranty will be construed to limit any rights or remedies the State of Utah may otherwise have under this contract.

11. **PRICING AND INVOICING:** Prices to be paid for item(s) ordered are the prices listed on this Purchase Order, which include all shipping and delivery charges, unless otherwise described on this order. CONTRACTOR WILL, AFTER DELIVERY, PROMPTLY SUBMIT A CORRECT INVOICE TO THE ORDERING AGENCY. Contractor agrees that the state has a right to adjust any invoice that reflects incorrect pricing. Unless otherwise specified, payment terms shall be Net 30 days. Where prompt payment discounts apply, the period for computing a discount shall begin on the date a correct invoice, including any adjustment for damage or incomplete shipment, is received by the state. Discount will be taken on the total amount of the invoice.

12. **DELIVERY:** Orders must be shipped directly to ordering agency at address specified. Shipments must be made in accordance with the item(s) as described and priced on this order. Also, orders must be shipped F.O.B. Destination, Freight Prepaid, unless other shipping instructions are described in this order. UNLESS INDICATED OTHERWISE, ALL ORDERS MUST BE SHIPPED PROMPTLY (WITHIN 5 WORKING DAYS), UPON RECEIPT OF ORDER. All items listed on this Purchase Order are subject to the approval of the ordering agency. Items rejected by ordering agency for not conforming to specifications in this order shall be at Contractor's risk.

13. **PURCHASE ORDER NUMBER:** PURCHASE ORDER NUMBER must be clearly shown on shipping labels, packing slips, invoices and correspondence relating to this purchase.

14. **PATENTS, COPYRIGHTS, ETC.:** The Contractor shall release, indemnify and hold the Buyer, its officers, agents and employees harmless from any liability of any kind or nature, including the Contractor's use of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article or appliance furnished or used in the performance of this contract.

15. **PUBLIC INFORMATION**: Contractor agrees that the purchase order and any response to related bids will be public documents, as to distribution of copies, and Contractor gives the STATE express permission to make copies of the purchase order, bid response, related sales orders, and invoices in accordance with the State of Utah Government Records Access and Management Act. The permission to make copies as noted will take precedence over any statements of confidentiality, proprietary information, copyright information, or similar notation.

UTAH NATIONAL GUARD CAMP WILLIAMS
PECK FIELD GRADING/DRAINAGE IMPROVEMENTS

SPECIFICATIONS AND PLAN SHEETS

August 2005

Civil Science, Inc.
3160 West Clubhouse Drive
Lehi, UT 84003
(801) 768-7200

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GENERAL REQUIREMENTS

SECTION 01010 - SUMMARY OF WORK

PROJECT LOCATION

The project is located at Camp Williams, 117800 South Camp Williams Road, Riverton, UT. Access to the site is through the Camp Williams main gate. Two forms of picture I.D. are required for entry to the site.

WORK UNDER THIS CONTRACT

The work under this contract generally includes grading and drainage improvements to Peck Field. The Field is located between Nevada Avenue and Utah Avenue adjacent to 3rd Street. The project includes, but is not limited to, construction of the following:

GRADING, PIPING, AND APPURTENANCES

- Site Grading (topsoil)
- Landscaping
- Corrugated High Density Polyethylene Pipe and Fittings
- Catch Basins
- Sprinkler Repair

MISCELLANEOUS

- Bonds and insurance
- Submittals
- Mobilization
- Field Staking and Cut Sheet Preparation- Minor Grade and Alignments to accommodate existing utilities
- Surface Restoration
- Hydroseeding

SUBSURFACE INFORMATION

The submission of a Proposal shall be conclusive evidence that the Bidder has investigated the site and is satisfied as to the conditions to be encountered, the character, quality, and quantities of work to be performed and materials to be furnished, and as to the requirements of the Contract Documents.

GRADES, LINES AND LEVELS

The Contractor shall be responsible for all required construction surveys.

Locations and elevations are shown on the plans.

CONTRACT DRAWINGS

Where Contractor bases his bid upon quantities scaled from Contract Drawings, he shall verify true scale with the Owner's representative prior to submitting his bid when scale is not shown or unclear.

SECTION 01080 - APPLICABLE CODES

The Contractor shall comply with the following and all applicable local codes, standards, rules and regulations of any authority having jurisdiction over the project site or the work to be performed.

International Plumbing Code (IPC), Latest Edition

Rules and Regulations Governing Excavation Work
Utah Occupational Safety and Health Administration

Williams-Steiger Occupational Safety and Health Act of 1970, Public Law 91-596

NOTICE: Protection of life, health, and public welfare as it relates to execution of the construction contract is the responsibility of the Contractor. Neither the Owner nor the Engineer will provide observation, inspection, supervision, or any comment on plans, procedures, or actions employed at the project as they relate to safety of life, health, or public welfare. If conditions are imposed by the Engineer or Owner which interfere with, or imply actions detrimental to safety, written notice shall be issued by the Contractor and a decision shall be returned to the Contractor for action prior to effecting any unsafe procedure or condition.

CONFLICTS

In case of conflict between codes, the one having the more stringent requirements shall govern. Drawings and specifications which exceed code requirements shall govern.

SECTION 01200 - PROJECT MEETINGS

JOBSITE PROGRESS MEETINGS

Conduct periodic jobsite meetings at intervals to be determined by the Owner, for the purpose of reviewing, scheduling and coordinating project progress, as well as other matters of general interest to the project.

SECTION 01300 - SUBMITTALS

INSURANCE CERTIFICATES

Submit updated certificates as necessary to verify current coverage.

PROJECT DATA SUBMITTAL SCHEDULE

List all anticipated submittals of project data as required by the Contract Documents and such additional data as considered necessary by the Contractor. Show proposed submittal dates for each so that Engineer may schedule timely review of submittals. Update monthly to reflect current status.

SCHEDULE OF VALUES

Where payment is to be based on unit bid prices, correlate schedule of values with bid items. Where payment is to be based on fixed price, correlate schedule of values with Divisions and Sections of Specifications. If separate payment is to be requested for materials suitably stored but not installed, segregate delivered costs, including taxes, from installation which include overhead and profit.

SHOP DRAWINGS, SAMPLES AND PRODUCT DATA

General - Submittals on component parts forming a system, or that are interrelated, shall be submitted at one time as a single submittal in order to demonstrate that the items have been properly coordinated and will function as a unit. Specific submittal requirements are as follows and are required for the items of equipment and materials noted in the Submittal Register at the end of this section.

Shop Drawings - Furnish office-prepared shop drawings to scale clearly showing the interrelationship of the various portions of work including the relationship to the work of other trades prior to commencing fabrication or installation of the work. As needed, provide a written description of the methods to be used in completing the work. Include location of each item, pertinent dimensions affecting construction, description of materials, and connections. Connection details shall show size and locations of bolts and size, shape, and lengths of each weld. Identify details by reference to sheet and detail numbers shown on Contract Drawings. Use same symbols wherever practicable. Reproductions of Contract Drawings are acceptable as shop drawings only when specifically authorized in writing by the Engineer.

Samples - Submit all required physical examples to illustrate materials, equipment or workmanship, which establish standards by which completed work is judged. Must be of sufficient size and clarity, and in sufficient quantity to clearly illustrate functional characteristics and full range of colors, patterns, textures or other properties which will be actually produced.

Product Data - Submit manufacturer's schematic drawings, catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, test reports, certificates of compliance, and other descriptive data not included on shop drawings. Modify standard descriptive data to delete information which is not applicable, and clearly identify pertinent data. Show dimensions and clearances required, performance characteristics and capacities, wiring diagrams and controls, and any other pertinent data applicable to the project.

Certificate of Compliance - Furnish manufacturer's Certificate of Compliance certifying to compliance with specification requirements, applicable reference standards, and test data requirements. Include reference to the specification section and paragraph with which the product or material is intended to comply.

Submission Requirements

Submittals shall be made with a letter of transmittal to the Engineer by the Contractor, and not by subcontractors, suppliers or manufacturers.

Submit samples in number specified, or if not so specified, in triplicate.

Submit Project Data in the quantities shown in the Submittal Register located at the end of this section.

Identify all submittals with the following information, as applicable:
Project title and Engineer's project number.
Name of Contractor, Engineer, originating subcontractor or supplier.
Submittal date, and all revision dates.
Identify each product or material submittal by reference to specification section and page no., drawing no., or any other contract document reference applicable thereto.
Applicable conformance standards.

Include certification of Contractor review and conformity to contract requirements per General Conditions. Identify any deviations from Contract Documents. Provide 3" x 3" minimum space for Engineer's review stamp.

EQUIPMENT MANUALS

Installation instructions, start-up and operating instructions, inspection and maintenance instructions, replacement parts list, and manufacturer's as-built diagrams.

PROJECT RECORD DOCUMENTS

Maintenance of Documents

Maintain at jobsite one record copy of Contract Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders, other modifications to the Contract, field test records and other approved documents submitted by Contractor in compliance with specification requirements.

Maintain documents at the project apart from documents used for construction. Do not use record documents for construction purposes. Maintain documents in clean, legible condition. Make documents available at all times for inspection of the Engineer and Owner.

As-built information shall be kept current in both drawings and Project Manual and shall be inserted by the Contractor and appropriate subcontractors as the project progresses under the supervision of the resident project representative. Each person making a change shall identify the change marked with the date and initials in a code and manner approved by the Engineer. Progress billings will not be paid until the resident project representative has reported to the Engineer that all record documents are complete and up-to-date as of the current billing.

Upon completion of the project, the record documents will be consolidated and delivered by the Engineer to the Owner. The Engineer will not verify the accuracy of information furnished by the Contractor, and the Contractor shall be responsible for any damage to the Owner or the Engineer arising from any errors or omissions relating to the data furnished by the Contractor, his subcontractors, suppliers and employees.

Recording

Label each document "PROJECT RECORD COPY" in 2" high printed letters. Keep record documents current. Do not permanently conceal any work until required information has been recorded.

Contract Drawings - Refer to Section 01010 -SUMMARY OF WORK, paragraph "Grades, Lines and Levels." Legibly mark most appropriate drawing to record, where applicable:

Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.

Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.

Field changes of dimension and detail made during construction process.

Changes made by Change Order or Field Order

Details not on original Contract Drawings.

Shop Drawings - Maintain as record drawings. Legibly annotate shop drawings to record changes made after review. Use red felt tip marking pen for all recording.

Submittal

At completion of project, deliver record documents to the Engineer. Accompany submittal with transmittal letter, in duplicate, containing:

Date, project title and number.
Contractor's name and address.
Title and number of each record document.
Certification that each document as submitted is complete and accurate.
Signature of Contractor or his authorized representative.

Submittal Register

Provide the following submittals:

Work	Item	Type of Submittal	Time of Submittal	# Of Copies
Precast Concrete	Catch Basins	Shop Drawing/ Certificate	Prior to Shipment	3
Piping Corrugated	Polyethylene Pipe	Shop Drawing/ Certificate	Prior to Shipment	3
	Fittings	Shop Drawing/ Certificate	Prior to Shipment	3
Misc.	Construction Surveying	Cut Sheet	3 Day, Prior to Work	3
	Grass Seed	Seed Mix Design	Prior to Shipment	3

SECTION 01400 - QUALITY CONTROL

TESTS AND INSPECTIONS

Utility Trenching, Backfilling, and Compacting - Section 02220

REQUIREMENTS FOR INDEPENDENT TESTING CONSULTANTS

Test Reports

Testing agency shall be instructed to submit directly to Engineer, 3 copies of all reports of tests or inspections made, showing compliance, irregularities or deficiencies, identifying project, date of test, location in project, applicable specification section, applicable standard(s) for compliance, observations relating to compliance, name and signature of inspector.

CONTRACTOR RESPONSIBILITIES

Furnish above qualification data and expedite submittals when testing consultant is employed by Contractor. Provide access to the work and furnish casual labor and facilities to accommodate inspections and tests. When tests fail to meet specified requirements, Contractor shall arrange for re-testing after conditions have been corrected. Conduct such retesting at no additional expense to the Owner.

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

GENERAL

Contractor shall be responsible for providing or arranging with subcontractors for all temporary utilities, facilities and controls during the construction period.

TEMPORARY UTILITIES

Water

Water for construction purposes is available in limited quantities from the current system at Camp William.

Electric Power and Lighting

The Contractor shall provide necessary transformers or other equipment, make necessary connections and provide necessary distribution lines for use by all trades during construction at locations so that power can be secured at any working area with no more than 100-foot extension.

SANITARY FACILITIES

Contractor shall provide and maintain, throughout project duration, adequate temporary toilet facilities in a neat and sanitary condition for all employees and authorized visitors at the site. Place facilities at approved locations near the work.

FIELD OFFICES AND STORAGE FACILITIES

Provide and maintain storage sheds, trailers or other facilities as necessary to store and protect materials, tools and equipment.

Coordinate location of all temporary office and storage facilities with Camp Williams staff.

FENCES AND BARRICADES

Provide and maintain temporary fences, barriers, lights, guardrails and barricades as indicated in the Contract Documents, or as necessary to regulate vehicular and pedestrian traffic, to secure the work and adjacent property, and to protect persons and property. Obtain necessary approvals and permits and provide temporary expedients as necessary to accommodate controls.

SECTION 01550 - MEASUREMENT AND PAYMENT

LUMP SUM BID

Payment is to be made on a lump sum basis for all work shown on the drawings and detailed in the specifications.

SECTION 01600 - MATERIAL AND EQUIPMENT

PRODUCTS LIST

Within 30 days after date of Purchase Order, submit to Engineer a complete list of all products which are proposed for installation. Tabulate list by, and be complete for, each specifications section. Include with listing of each product the name and address of manufacturer, trade name, model or catalog designation, reference standard, manufacturer's performance and test data, and subcontractor, as applicable.

REFERENCE STANDARDS

Reference in the specifications to standard specifications or publications or technical societies or governmental agencies, such as ASTM, ANSI, AISC, ACI, AWS, Federal Specifications, or Commercial Standards shall refer to latest edition adopted and published 30 days prior to receiving bids, unless specifically noted otherwise in the Contract Documents. It shall be understood that all manufacturers, producers and their agents, of materials required shall have such reference standards available for reference and be fully familiar with their requirements as pertains to their product, material or equipment.

In case of conflict between reference standards and project specifications, project specifications shall govern. In case of conflict between reference standards and codes, the one having the more stringent requirements shall govern.

MANUFACTURER'S INSTRUCTIONS

Contractor shall obtain and distribute necessary copies of manufacturer's instructions, including two copies to the Engineer. If a conflict exists between the manufacturer's instructions and the Contract Documents, notify the Engineer in writing and obtain his instruction prior to proceeding.

PRODUCT DELIVERY, STORAGE AND HANDLING

Deliver materials, products and equipment to the project site in undamaged condition in manufacturer's original, unopened containers or packaging with identifying labels intact and legible. Arrange deliveries in accordance with the Construction Schedule and in ample time to facilitate inspection prior to installation to avoid unnecessary delays in the construction process.

Store and handle products as prescribed by manufacturer or as specified in the Contract Documents in a manner to protect from damage by moisture, weather, abuse or construction operations.

DETAILED SPECIFICATIONS

SECTION 02200 - STRUCTURAL EARTHWORK

PART I - GENERAL

DESCRIPTION

Work Included - Work under this section includes clearing and grubbing, excavation, filling, compacting, and testing for structural earthwork, around foundations, manholes,and similar buried structures, excluding utility trenching, backfilling and compacting; all as shown on the drawings and specified herein.

Related Work Specified Elsewhere
Section 01400 - Quality Control
Section 02220 - Utility Trenching, Backfilling and Compacting
Section 02800 - Landscaping

QUALITY ASSURANCE

Reference Standards - Standards listed hereunder and referenced elsewhere in these specifications shall become a part of this specification and are incorporated herein by reference. The latest edition, amendment or supplement thereto in effect 30 days before date of invitation shall apply.

American Society for Testing and Materials (ASTM)

ASTM D1557	Moisture-Unit Weight Relations of Soils and Soil Aggregate Mixtures Using 10 lb. Rammer and 18 inch drop
ASTM D2049	Relative Density of Cohesionless Soils
ASTM D2922	Density of Soil and Soil-Aggregate-In-Place by Nuclear Methods (Shallow Depth)

American Association of State Highway and Transportation Officials

AASHTO T180	Moisture-Density Relations of Soils using a 10 lb. Rammer and a 18 inch drop

SUBMITTALS - Refer to Section 01300 - Submittals. Submit the proposed sheeting and shoring methods to be employed by the Contractor.

JOB CONDITIONS

Protection

Surface Improvements - Protect from damage or restore to their original condition, all surface improvements encountered during trenching or construction. Said improvements shall include but not be limited to surfacing, sidewalks, curbs, valley gutters, trees and shrubs, other surface vegetation, driveways, mailboxes, utilities, signs, and fencing.

Underground Obstructions
Protect from damage any underground pipes, utilities or structures encountered during construction. Restore any damaged underground obstructions to their original condition at no additional expense to the Owner unless evidence of other arrangements satisfactory to all parties are presented to the Owner.

Before commencing work, obtain information concerning location, type, and extent of concealed existing utilities on the site and adjacent properties. Consult records and

personnel of local utility companies, municipal utility departments, and telephone company. File Notice of Excavation with these agencies at least two business days prior to commencing work.

Underground obstructions known to the Engineer, except service lines, are shown on the drawings or otherwise referred to in the specifications. The locations shown may prove to be inaccurate and other obstructions not shown may be encountered. In any case, it shall be the responsibility of the Contractor to verify actual locations and to protect or restore all underground obstructions encountered.

Sheeting, Shoring and Bracing

Except where banks are cut back on a stable slope, provide and maintain all sheeting and shoring necessary to protect adjoining grades and structures from caving, sliding, erosion or other damage in accordance with applicable codes and governing authorities.

Remove sheeting and shoring gradually as excavation backfilling progresses to protect the construction or other structures, utilities or property.

Blasting - No blasting will be permitted without written consent by the Owner.

Drainage - Maintain the excavations and site free from water throughout the course of the work.

Interruption of Service

Coordinate interruptions of utility services with the Owner. Make connections to the existing system requiring the interruption of service during the time (weekends, nights or holidays) designated by the Owner.

Obtain permission to cut and replace existing service lines. Notify affected users two hours in advance of and restore service within four hours after any interruption. Repair all lines at no additional expense to the Owner.

No valve or other control on the existing system shall be operated for any purpose by the Contractor. The Owner will operate all valves, hydrants, blowoffs and curb stops.

Construction in Streets - When construction operations are located within streets, make provisions at cross streets and walks for free passage of vehicles and pedestrians. Do not block streets or walks without prior approval by the Owner.

CLASSIFICATION OF EXCAVATION

Unclassified Excavation - All required excavation shall be unclassified. All required excavation except borrow shall be unclassified.

Rock Excavation - Excavation of hard cemented material which cannot be excavated by heavy earthmoving equipment until loosened by blasting, excavation or material which is too hard to be satisfactorily loosened by a D-9 caterpillar tractor or its equivalent, equipped with a hydraulic single-tooth ripper, and removal of boulders which cannot be handled by heavy earth moving equipment will be classed as rock excavation.

Common Excavation - Excavation of all material other than those above will be classed as common excavation and includes, but shall not be limited to, excavation of earth, gravel, shale, cemented material, disintegrated rock, boulders and all other materials which, without blasting,

can be satisfactorily excavated by heavy earthmoving equipment with, or without, the use of heavy rippers.

Borrow Excavation - All suitable materials required for completion of the earthwork of this Contract and which are excavated from areas outside the indicated grading and excavation limits will be classified as borrow excavation.

PART II - PRODUCTS

SUITABLE MATERIALS - All materials for construction fills and backfills shall meet specified requirements for gradation and other factors defining suitability for the intended use. All classes of suitable material shall be free from perishable matter, debris, frozen material and stones and cemented pieces larger than permitted by the specified gradation. Suitable materials are defined as follows:

Structural Fill and Backfill - Materials used for structural fill under slabs or around structural foundations shall consist of material that is free of debris, roots, organic matter, frozen matter and which is free of stones with any dimension greater than one-half of the specified loose layer thickness. Material shall also be capable of compaction to specified density.

Capillary Water Barrier - Material shall consist of clean, non-porous rock, crushed or uncrushed, meeting the following gradation:

Sieve Size	Percent Passing
1-1/2"	100
3/4"	50-100
No. 4	0

Riprap - Riprap shall be hard, dense, sound, rough fractured stone as nearly cubical as practicable. Thin slab type stones, flaking rock, and broken concrete shall not be used. The stone shall have a specific gravity of at least 2.25. The size requirements for riprap are 10" diameter maximum with at least 30% larger than 4" and 30% passing the 2" sieve.

Topsoil - Topsoil shall consist of selectively excavated, loose, friable loam reasonably free of admixtures of subsoil, refuse, stumps, roots, rocks, brush, weeds or other material which would be detrimental to the development of vegetative growth.

Unclassified Fill and Backfill Material - Fills and backfills that are not otherwise specified herein shall be constructed with any suitable excavated material of clays, silts, sands, gravels, bedrock pieces or combinations thereof which contain 100 percent particles smaller than four (4) inches. This material shall be placed in accordance with the requirements hereinafter specified.

UNSUITABLE MATERIALS - All material removed in stripping and all material containing perishable matter such as roots, sod, grass, decayed vegetable matter, debris, frozen material or materials having unsatisfactory compaction characteristics will be classified as unsuitable for use in the work. Materials which are unsuitable due to excessive moisture or incorrect gradation may be reclaimed if brought into specification by screening, manipulation, aerating, or blending with other suitable materials.

PART III - EXECUTION

PREPARATION

Field Measurements - Before commencing work, locate all baselines required for control of the work and establish required grade staking for control of excavation and embankment construction.

Site Preparation - Clear all sites to be occupied by permanent construction embankments of all logs, trees, roots, brush, tree trimmings, and other objectionable materials and debris. Grub all stumps. Clean and strip subgrades for fills and embankments of all surface vegetation, sod, and organic topsoil. Remove all combustible and other waste materials from the site and legally dispose off the site. Observe applicable fire and safety regulations when waste materials are burned.

Preservation of Trees - Refer to drawings for designation of all trees, shrubs, plants and other vegetation within the project site to remain. Do not remove trees outside of excavated or filled areas, unless their removal is authorized by the Owner. Protect trees left standing from permanent damage by construction operations.

Removal of Topsoil - Strip existing topsoil from areas to be disturbed by construction operations. Stockpile in areas designated. Keep topsoil segregated from non-organic trench excavation materials and debris.

Removal of Water

Provide and maintain dewatering equipment to remove and dispose of all surface and groundwater entering excavations, trenches, or other parts of the work. Keep each excavation dry during subgrade preparation and continually thereafter until the structure to be built, or the pipe to be installed therein is completed to the extent that no damage from hydrostatic pressure, flotation, or hydraulic action will result.

Dewater all excavations for structures or trenches which extend down to or below static groundwater elevations by lowering and maintaining the groundwater surface beneath such excavations a distance of not less than 12 inches below the bottom of the excavation.

Divert or otherwise prevent surface water from entering excavated areas or trenches.

EXCAVATION

Prior to beginning excavation operations, accomplish all site preparation in accordance with these specifications. Perform excavation of every description to the lines and grades indicated on the drawings.

Closely examine soil at final grades to determine if soils are suitable. Refer questionable areas to testing laboratory. Notify Engineer of testing results and if a request for a field order or change order is apparently necessary.

If any areas are inadvertently over excavated, fill such over excavation with suitable fill material and compact to 95% of maximum density.

Complete excavation work to the grade elevations shown on the drawings within a tolerance of $\pm$ 0.1 foot.

EMBANKMENT AND BACKFILLING

Do not begin backfilling until forms and shoring have been removed, construction below grade has been observed, underground utilities systems have been inspected, tested and met specified requirements, and trash and debris have been cleaned from the excavation.

Do not cease dewatering operations until backfill has been completed.

Place excavated material in successive uniform maximum loose layers not exceeding 8 inches for the full width of the cross section in all accessible areas. Do not place fill on muddy or frozen subgrade.

Plow, step, or bench sloped surfaces steeper than 4 to 1 on which fill or backfill is to be placed so that fill material remains firm and stable. Scarify all surfaces to receive backfill to a depth of 6" before filling.

Construct fills and embankments to the lines and grades indicated on the drawings within a tolerance of $\pm$ 0.1 foot.

Use suitable materials removed from the excavation prior to obtaining material from borrow areas.

Where otherwise suitable material is too wet, aerate, dry or blend to provide the moisture content required to achieve specified compaction.

COMPACTION

During placing and compacting operations upon earth or earth-and-rock mixtures, the moisture content of material in the layers being compacted shall be near optimum and uniform throughout the layer. Maintain the moisture content of the material being placed and compacted within $\pm$1-1/2% of optimum condition as determined by ASTM Standard D698.

Perform all compaction with equipment suited to location and material being compacted. Place and compact backfill around pipes, foundations, and other structures with care to avoid damage.

Compact fill and backfill materials to following minimum densities:

Structural Fill and Backfill	Under and adjacent to slabs, structural supports, foundations, or buttresses: 95% of maximum density
Unclassified Fill and Backfill	
Areas to Receive Pavements	95% of maximum density.
Overlot Areas	88% of maximum density.
Liquid Containing Earth Structures	95% of maximum density.

RIPRAP - Riprap shall be placed to conform to the drawing details. The larger size stones composing the riprap material shall be placed first and roughly arranged in close contact. The spaces between the larger stones shall then be filled with smaller stone and arranged in close contact. The spaces between the larger stones shall be so placed as to leave the surface evenly

stepped, conforming to the contour required. The material may be machined-placed with sufficient hand work to produce the specified results.

SURFACE RESTORATION

Subgrade Preparation - Immediately prior to placing structural slabs or foundations, shape the areas to the required lines, grades, and limits to provide finish elevations indicated, and roll with an approved heavy vibratory roller until compacted as specified. Maintain moisture content within ±1-1/2% of optimum during final rolling and until subgrade is covered by subsequent construction. Remove loose material and protect subgrade until covered.

Placing Topsoil

Place previously stockpiled or imported topsoil in all areas within the limits of the project not indicated to receive subsequent foundations, slabs on grade, walks, or other appurtenances.

Prior to placing topsoil, construct subgrades to elevation as required to develop sections shown on drawings after completion of topsoil placement. After grading, scarify areas to be topsoiled to a depth of at least 4". Perform work during periods of good weather and when subsequent disturbance from construction activity will not occur.

Uniformly distribute topsoil on the designated areas and evenly spread to a minimum thickness of 4". Perform spreading so that planting can proceed with little additional soil preparation or tillage. Do not place topsoil when subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to specified grading, seeding and planting.

Finish Grading

Grade all excavated sections, filled sections, construction disturbed areas, and adjacent transition areas to finish elevations. Make finished surfaces smooth, compact, and free from irregular surface changes.

Unless indicated otherwise on drawings, finish grade areas adjacent to sidewalks and pavements within 1 inch below finish elevation of sidewalk and pavement.

FIELD QUALITY CONTROL

Density Testing and Control - Refer to Section 01400 - Quality Control for responsibilities.

Soil Compacting Tests

Conduct in accordance with requirements of ASTM D1557 or AASHTO T180.

Use method A, B, C or D as appropriate, based on soil condition and judgement of the testing laboratory. Samples tested shall be representative of materials to be placed (or altered). Obtain optimum moisture density curve for each type of material or combination of materials encountered or utilized. Use test results as a basis for compaction control. Testing includes Atterberg Limits, grain size determination, and specific gravity.

Tests for cohesionless soils shall be conducted in accordance with ASTM D2049 if a well-defined moisture-density relationship curve is not obtainable by impact compaction methods.

Density Control Conduct tests for density control during compaction operations in accordance with the requirements of:

ASTM D2922 - Tests for Density of Soil and Soil-Aggregate in Place by Nuclear Methods, or,

Conduct a minimum of one test at locations designated for each lift placed or specified depth increments of fill or backfill as follows:

Foundation Walls: Every one foot vertically (per structure).
Pump Stations and Manholes: Every two feet vertically (per structure).
Slabs on Grade: For each 2,000 square feet or less.
Pavement and Walks: For each 2,000 square feet or less.
Pipe Trench: For each 500 feet or less.
All Other Areas: For each 5,000 square feet or less.

Protection

Contractor shall protect impervious linings after installation throughout the construction period and during filling operations. The lagoon shall be filled as soon as possible to protect the seal from runoff erosion on side slopes. Damage to impervious linings shall be repaired by the Contractor at no additional expense to Owner.

SECTION 02220 - UTILITY TRENCHING, BACKFILLING AND COMPACTING

PART I - GENERAL

DESCRIPTION

Work Included - Work under this section includes site preparation, earthwork and surface restoration for underground pipelines, conduits, cables and appurtenances as shown on the drawings and specified herein.

Related Work Specified Elsewhere
Section 01400 - Quality Control
Section 02200 - Structural Earthwork
Section 15064 - Plastic Pipe

QUALITY ASSURANCE

Reference Standards - Standards listed hereunder and referenced elsewhere in these specifications shall become a part of this specification and are incorporated herein by reference. The latest edition, amendment or supplement thereto in effect 30 days before date of invitation shall apply.

American Society for Testing and Materials (ASTM)

ASTM C33	Concrete Aggregates
ASTM D1557	Moisture-Unit Weight Relations of Soils and SoilAggregate Mixtures Using 10 lb. Rammer and 18 Inch Drop
ASTM D2049	Relative Density of Cohesionless Soils
ASTM D2922	Density of Soil and Soil-Aggregate In-Place by Nuclear Methods (Shallow Depth)

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO T180	Moisture Density Relations of Soils Using a 10 lb. Rammer and a 18 -inch Drop

SUBMITTALS - Refer to Section 01300 - Submittals. Include the following:

Samples - Test sample of pipe bedding material.

JOB CONDITIONS

Protection

Surface Improvements - Protect from damage or restore to their original condition all surface improvements encountered during trenching or construction. Improvements shall include but not be limited to surfacing, sidewalks, curbs, valley gutters, trees and shrubs, other surface vegetation, driveways, mailboxes, signs, and fencing.

Underground Obstructions

Protect from damage any underground pipes, utilities or structures encountered during construction. Restore any damaged underground obstructions to their original condition at no additional expense to the Owner unless evidence of other arrangements satisfactory to all parties are presented to the Owner.

Before commencing work, obtain information concerning location, type, and extent of concealed existing utilities on the site and adjacent properties. Consult records and personnel of local utility companies, municipal utility departments, and telephone company. File Notice of Excavation with these agencies at least two business days prior to commencing work.

Underground obstructions known to the Engineer, except service lines, are shown on the drawings or otherwise referred to in the specifications. The locations shown may prove to be inaccurate and other obstructions not shown may be encountered. In any case, it shall be the responsibility of the Contractor to protect or restore all underground obstructions encountered.

All utilities exposed during construction shall be inspected by the utility owner prior to backfilling. Contractor shall be responsible for providing adequate notice to utility owner for inspections.

Sheeting, Shoring and Bracing

Except where trench banks are cut back on a stable slope, provide and maintain all sheeting and shoring necessary to protect adjoining grades and structures from caving, sliding, erosion or other damage in accordance with applicable codes and governing authorities.

Do not remove any sheeting unless the pipe strength is sufficient to support the trench loads based on trench width measured to the back of sheeting. Remove sheeting and shoring gradually as excavations are backfilled to protect the construction and other structures, utilities or property.

Blasting - No blasting will be permitted without written consent by the Owner.

Drainage - Maintain the excavations and site free from water throughout the work. Remove any water encountered in the trench to provide firm subgrade, to permit joints to be made dry at the final grade and to prevent entrance of water into the pipeline.

Accomplish dewatering by the use of sumps and gravel blankets, well points, or drain lines.

Interruption of Service

Coordinate interruptions of utility services with the Owner. Make connections to the existing system requiring the interruption of service during the time (weekends, nights or holidays) designated by the Owner.

Obtain permission to cut and replace existing service lines to facilitate trenching. Notify affected users two hours in advance of, and restore service within four hours after any interruption. Repair all lines at no additional expense to Owner.

No valve or other control on the existing system shall be operated for any purpose by the Contractor. The Owner will operate all valves, hydrants, blowoffs and curb stops.

Sequencing - Pipeline installation shall follow trench excavation within 300 lineal feet. Trench backfill shall follow pipe installation within 100 lineal feet. Cleanup shall follow trench excavation within 1,000 lineal feet.

Construction In Streets - When construction operations are located within streets, make provisions at cross streets and walks for free passage of vehicles and pedestrians by bridging or other approved methods. Do not block streets or walks without prior approval by the Owner.

CLASSIFICATION OF EXCAVATED MATERIALS - No classification of excavated materials will be made. Perform excavation of every description and of whatever substance encountered to the depths indicated or as otherwise specified.

GUARANTEE

Trench Maintenance - Maintain all trench backfill and resurfacing thereon for a period of one year after final acceptance by the Owner. Refer to General Conditions.

PART II - PRODUCTS

EMBEDMENT MATERIALS

Granular Material - Well graded crushed stone or gravel meeting the requirements of ASTM C33, Gradation 67 (3/4" to No. 4).

Select Backfill - Selected soil free from rocks, clods and stones greater than 2" in any dimension. Screened native material may be used.

BACKFILL MATERIALS

Suitable Material - Soil obtained from the excavation that is free of frozen material, stumps, roots, brush, other organic matter, and debris. In addition, material shall meet the following requirements:

Upper Portion of Trench - Material placed within one foot of pavement subgrade or the finished surface in unpaved areas shall be soil free from rocks and stones larger than 2-1/2 inches in any dimension.

Remainder of Trench - Soil may contain a limited number of stones smaller than 6 inches in any dimension, provided they are dispersed in the surrounding material in a manner to allow specified compaction.

Public Highways - Material placed within the limits of paved surfacing, gravel shoulders or shoulder slopes shall be approved by the agency having jurisdiction over highway maintenance.

PART III - EXECUTION

PREPARATION

Field Measurements - Before commencing work, locate all initial base lines as required by the Contract Documents.

Clearing

Remove all stumps, roots, brush, other vegetation and debris from areas that will be disturbed by the construction operations.

Legally dispose of all cleared materials at public or private dumping areas off the Owner's property.

Topsoiling - Strip existing topsoil from areas to be disturbed by construction operations. Stockpile in areas designated. Keep topsoil segregated from non-organic trench excavation materials and debris.

EXCAVATING

Trenching - Excavate trenches by open cut. Conform to sheeting, shoring and bracing requirements of regulating agency or ruling authority.

Stockpiling Excavated Material

Stockpile suitable material for backfilling within construction easement.

Remove and waste off the site excavated materials not suitable or not required for backfilling.

Excavation to Grade - Accurately grade trench bottoms to provide uniform bedding depth and support for each section of pipe on compacted bedding material at every point along its

entire length, except portions of pipe sections where it is necessary to excavate for bell holes and for proper sealing of pipe joints.

Bell Holes - Dig bell holes and depressions for joints after trench bottom has been graded. Bell holes and depressions shall be only of such length, depth, and width as required for properly making the particular type of joint. The use of earth mounds for bedding the pipe will not be allowed.

Pipe Clearance In Rocks - Where rock excavation is necessary, over excavate the trench bottom a minimum of six inches below the bottom of the pipe for pipe 24 inches in diameter or less and 9 inches for pipe larger than 24 inches. Backfill overdepths with concrete or granular material. Compact granular material to 95% of maximum density.

Unstable Pipe Subgrade - Whenever wet or otherwise unstable material that is incapable of supporting pipe is encountered in the bottom of the trench, over-excavate such material to a depth suitable for construction of a stable pipe bedding. Backfill trench to proper grade with granular material and compact to 95% of maximum density.

Limiting Trench Widths

Excavate trenches to provide adequate working space and pipe clearances for proper pipe installation, jointing and embedment. Provide a minimum clearance of 3 inches on each side of the pipe for pipe 12 inches in diameter or less, 8 inches for pipe between 14 inches and 30 inches in diameter, and 12 inches for pipe larger than 30 inches in diameter.

Maximum trench width measured at the top of the pipe shall not exceed the outside diameter of the pipe plus 24 inches for pipe 24 inches in diameter or smaller and plus 30 inches for pipe larger than 24 inches.

Unauthorized Excavation

If any areas are inadvertently overexcavated, backfill such overexcavation with concrete or granular material. Compact granular material to 95% of maximum density.

If the maximum trench width is exceeded, provide concrete encasement or a higher strength of pipe at no additional expense to the Owner.

PIPE EMBEDMENT

Placing Embedment Material - Place granular pipe bedding or screened native material to a cover depth of one foot by hand to prevent damage or displacement of the pipe.

TRENCH BACKFILLING AND COMPACTING - Deposit material in layers of a thickness required to achieve the compaction specified below. Maintain moisture content of material within ±1-1/2% of optimum condition.

State Highways

100% of maximum density for paved areas and shoulder slopes.

Paved Roadways, Sidewalks and Other Areas to Receive Pavement

Top foot: 95% of maximum density.
Remainder of trench: 90% of maximum density.

Gravel Roadways

95% of maximum density.

Sodded or Lawn Areas

88% of maximum density.

Fields and All Other Areas

80% of maximum density or equal to the density of undisturbed adjacent material, whichever is greater.

Pipings In Roadways

95% of maximum density.
All other Pipings - 90% of maximum density

Method of Compaction

Mechanically compact trench backfill by means of tamping rollers, sheep foot rollers, pneumatic tire rollers, vibrating rollers or other mechanical tampers.

Compaction by jetting will be permitted under the following conditions:

- Backfill consists of fine granular material which does not contain clay or other expansive material which prevents complete water penetration.

- Areas are neither adjacent to nor will receive subsequent improvements such as pavements, and surfacing structural slabs and foundations, or other improvements.

- The procedures will not cause damage or otherwise affect the system installation causing unstable conditions or conditions less than specified. Compaction requirements shall be met.

- The Contractor shall submit proposed procedures for review to the Engineer at least 48 hours in advance of commencing the work.

Compaction by jetting will not be permitted for state highways, paved roadways, gravel roadways, structural foundations, or any other structures and improvements which sustain design loadings relative to public health and safety.

FIELD QUALITY CONTROL

Density Testing and Control - Refer to Section 01400 - Quality Control, for responsibilities.

Soil Compaction Tests

Conduct in accordance with requirements of ASTM D1557 or AASHTO T180.

Use method A, B, C or D as appropriate, based on soil condition and judgment of the testing laboratory. Samples tested shall be representative of materials to be placed (or altered). Obtain optimum moisture density curve for each type of material or combination of materials encountered or utilized. Use test results as a basis for compaction control. Testing includes Atterberg Limits, grain size determination, and specific gravity.

Tests for cohesionless soils shall be conducted in accordance with ASTM Standard D2049 if a well-defined moisture-density relationship curve is not obtainable by impact compaction methods.

Density Control - Conduct tests for density control during compaction operations in accordance with the requirements of ASTM D2922 - Tests for Density of Soil and Soil-Aggregate in Place by Nuclear Methods.

Conduct a minimum of 2 tests for every 1,000 lineal feet of trench at locations and depths designated by the Engineer. Excavate to depths directed to accommodate testing. Backfill and compact test holes as specified herein.

If minimum compaction requirements are not met as determined by these tests, Contractor shall recompact trench to the specified compaction. Such recompaction shall extend both upstream and downstream of the failed test a distance equal to half the distance from where the last compaction test was taken or 165 feet, whichever is least. Remedial compaction and retesting shall be conducted at no additional expense to the Owner. Refer to Section 01550 - Measurement and Payment, regarding completion of compaction.

SURFACE RESTORATION

Final Grading - Grade all areas disturbed by the construction operations after completion of backfilling and compacting. Areas which are to receive pavements, surfacing, topsoil, seeding or landscaping shall be graded as specified or shown on the drawings. Grade all other areas to match the existing ground line.

Topsoiling - Replace suitable topsoil to the depth of stripping over all areas disturbed by the construction that do not receive other surface treatment. Do not compact topsoil during stripping, stockpiling or placing.

Sod Replacement

Sod removed prior to excavation shall be transplanted within 24 hours after lifting unless wet or freezing conditions prohibit normal laying operations.

Prior to laying, till the sodbed to a minimum depth of 3 inches. Soil texture after tillage shall be uniform, free of wet compressed or dry lumps.

Prior to laying, inspect the sod for dead or otherwise damaged areas and replace any sections showing damage. Replacement sod shall match existing sod as closely as possible.

Lay sod smoothly edge to edge and press firmly into contact with underlying soil by rolling or tamping to eliminate air pockets. Where the sod and sod bed are too dry to produce specified results during rolling, water the dry sod and sod bed prior to commencement of rolling.

SURFACE IMPROVEMENT REPAIR AND REPLACEMENT - Replace and repair any surface improvements damaged or removed. Restore each disturbed improvement to original condition.

SECTION 02800 - LANDSCAPING

PART I - GENERAL

DESCRIPTION

Work Included - Work under this section includes topsoil preparation, lawn seeding and sodding, shrub and tree planting, preparation and placement of stone aggregate beds, and preparation and placement of wood chip beds.

Related Work Specified Elsewhere
Section 02200 - Structural Earthwork

SUBMITTALS - Refer to Section 01300 - Submittals. Include the following:

Product Data - Submit data for all trees, shrubs, plants, and seed to be included in the work. State origin of all plants, trees and shrubs.

Certificates of Compliance - Submit certification that grass seed has been tested by a recognized laboratory for seed testing within 6 months prior to delivery. Submit performance certificates for mulching products.

PART II - PRODUCTS

TOPSOIL - Topsoil shall be loose friable loam free of stumps, roots, rocks, brush, weeds, subsoil, refuse, or other material detrimental to proper development of vegetative growth. Sphagnum peat consisting of 95% organic matter may be used to condition otherwise unacceptable soils.

MULCH

Straw Mulch - Straw mulch shall be straw of oats, barley, wheat, rye free from seed of noxious weeds; or, clean field or marsh hay free from noxious weeds. Do not use straw or hay which is in advance state of decomposition or which breaks when crimped.

Wood Cellulose Fiber - Commercial product specifically manufactured for use with grass seed. Express application requirements of product in terms of air dry weight (10% maximum allowance for moisture content).

GRASS SEED

Quality seed free of noxious seeds as Russian or Canadian Thistle, European Bindweed, Johnson Grass, or Leafy Spurge. Do not use seed that has become wet or moldy.

Indicate supplier, lot number, net weight, percent weed seed content, and guaranteed percent purity and germination.

Lawn Seed

Seed Mix, % by Wt.	33
Common Name	Kentucky Bluegrass
% Purity	99
% Germination	90
Application Rate per 1,000 sq. ft.	2 pounds

Conform to State and Federal regulations and to provisions of the Association of Official Seed Analysis.

SOD - Nursery grown, less than 1% weed content and free of perenial or annual grasses and plants. Minimum soil thickness of sod: 3/4" to 1". Cut uniform strips 18 inches wide and not less than 6 feet long. Do not use sod that has been cut more than twenty hours.

FERTILIZER

Seeding - Commercial standard brand fertilizer having 18% minimum available nitrogen and super phosphate (45% minimum P2O5).

Sod - Commercial fertilizer, 20-20-10 formula. Product conforming to State fertilizer laws, delivered in dry, uniform condition in original unopened containers bearing manufacturer's guaranteed analysis.

PART III - EXECUTION

GRASS SEEDING

General - Plant seeding in between May 1, 2006 and May 15, 2006.

Topsoil - Place and spread to thickness at location shown on drawings. Key to underlying surface by means of harrows, rollers, or other suitable equipment. Do not begin placement until areas have been graded and prepared as specified.

Soil Preparation - Remove all ground surface irregularities to eliminate low areas where water will stand. Immediately prior to seeding, lightly till soil into an even and loose seedbed at the specified line and grade.

Fertilizing - Till super phosphate in the top 2" of soil at the rate 0.4 lb. per 1000 sq. ft. prior to seeding. Follow with second application of fertilizer (minimum 18% available nitrogen) at rate of 1 lb. nitrogen per 1000 sq. ft. 6 to 8 weeks following planting.

Seeding

Apply seed with mechanical landscape drill so that seed will have about 1/4" cover. Do not drill seed in windy weather or when ground is frozen. Use broadcast or hydraulic seeding methods only in areas inaccessible to machine methods.

Contractor may elect to use hydraulic seeding equipment capable of pumping 100 gallons per minute at 100 lbs. per square inch. Provide means for estimating volume used or remaining in storage tank.

Water and maintain seeded areas for periods of 5 weeks following seeding. Avoid standing water, surface wash, or scour. Protect seeded areas from vehicle and pedestrian traffic by use of barriers and signs.

Reseed areas where stand of grass has not been produced in a 5-week period.

Mulching - Add cellulose fiber mulch in proportional quantities with water into a slurry tank and thoroughly mix. Spray mulch uniformly over seeded areas at a rate of 1,000 pounds per acre. Do not mulch in the presence of free surface water resulting from rain, melting snow, or similar causes. May be combined with hydraulic seeding operation specified above.

SODDING

Soil Preparation - Remove all sticks, stones, debris, and objects more than 1/2" in diameter. Smooth irregularities prior to any sodding.

Sodding - Lay sod by staggering joints. Run strips of sod at right angles to slopes.

Fertilizing - Fertilize sod with 20-20-10 commercial fertilizer at rates of 1 lb. nitrogen per 1000 sq. ft. Soak sod after application of fertilizer. After sod has dried sufficiently to allow effective rolling, roll with a lawn roller weighing not less than 150 lbs. to secure a tight bond to subgrade and between strip joints.

SECTION 15064 - PLASTIC PIPE

PART I - GENERAL

DESCRIPTION

Work Included - Work under this section includes furnishing and installing plastic pipe and fittings. Furnish pipe and fittings complete with all jointing materials as shown on the drawings and as specified herein.

Related Work Specified Elsewhere
Section 02200 - Structural Earthwork
Section 02220 - Utility Trenching, Backfilling and Compacting

QUALITY ASSURANCE

Pipe and Fittings Marking - Mark pipe with the following information applied at intervals of not more than 5 feet:
Nominal size and O.D. base.
Material code designation.
Applicable dimension ratio, pressure class or schedule number.
Applicable standard designation number.
Manufacturer's name or trade mark.
Seal of the testing agency that verified the suitability of the pipe material for potable water service.

Reference Standards - Standards listed hereunder and referenced elsewhere in these specifications shall become a part of this specification and are incorporated herein by reference. The latest edition, amendment or supplement thereto in effect 30 days before date of invitation shall apply.

American Society for Testing and Materials (ASTM)

ASTM D3212	Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM	Standards Referred to in TYPE S (DOUBLE WALL) CORRUGATED HIGH DENSITY POLYETHYLENE PIPE (CHDPEP)

SUBMITTALS

SUBMITTALS - Refer to Section 01300 - Submittals. Include the following:

Certificates - Submit manufacturer's certification that materials meet specification requirements.

PRODUCT DELIVERY, STORAGE AND HANDING

Protect pipe from impact, bending, compression or abrasion during handling and storage.

Store pipe on flat surface which provides even support for the pipe barrel with bell ends overhanging. Do not stack pipe higher than 5 feet. Do not store pipe and fittings in direct sunlight for periods greater than two weeks.

Ship rubber gaskets in cartons and store in a clean area away from grease, oil, ozone producing electric motors, heat and the direct rays of the sun.

Use nylon sling to handle pipe. The use of hooks or bare cables will not be permitted.

PART II - PRODUCTS

TYPE S (DOUBLE WALL) CORRUGATED HIGH DENSITY POLYETHYLENE PIPE (CHDPEP)

Pipe and fittings shall be made of polyethylene (PE) compounds which conform with the requirement of cell class 324420C (min), as defined and described in ASTM D3350, except that carbon black content shall not exceed 5%.

Minimum parallel plate pipe stiffness values shall be as follows:

Diameter	Pipe Stiffness per ASTM Test Method D-2412
12"	50 PSI
15"	42 PSI
18"	40 PSI
24"	34 PSI

The nominal size for the pipe and fittings is based on the nominal inside diameter of the pipe.

The pipe and fittings shall be free of foreign inclusions and visible defects. Fittings may be either molded or fabricated. Fittings supplied by manufacturers other than the supplier of the pipe shall not be permitted without the approval of the project engineer. The ends of the pipe shall be cut squarely and cleanly so as not to adversely effect joining.

Pipe shall have a smooth interior and annular exterior corrugations.

12- through 48-inch shall meet AASHTO M294, Type S.

Manning's n value for use in design shall not be less than 0.010.

Joint Performance

12"- through 60" pipe shall be watertight according to the requirements of the modified ASTM D3212. Gaskets shall be made of polyisoprene meeting the requirements of ASTM F477 with the addition that the gaskets shall not have any visible cracking when tested according to ASTM D1149 after 72 hour exposure in 50 PPHM ozone at 104˚ Fahrenheit. Gaskets shall be installed by the pipe manufacturer and covered with a removable wrap to ensure the gasket is free from debris. A joint lubricant available from the manufacturer shall be used on the gasket and bell during assembly.

Fittings

Fittings shall conform to AASHTO M294 or AASHTO MP7. Fabricated fittings shall be welded at all accessible interior and exterior junctions.

Material Properties

Pipe and fitting material shall be high-density polyethylene meeting ASTM D3350 minimum cell classification 335420C.

Installation

Installation shall be in accordance with ASTM D2321, with the exception that minimum cover in trafficked areas for 12- through 48-inch diameters shall be 1 ft. and for 60-inch

diameter, the minimum cover shall be 1.5 ft. The pipe shall be bedded with 1 1/4" minus granular material.

Cut pipe and tubing square with saws or pipe cutters designed specifically for the material. Protect the pipe and fittings from serrated holding devices and abrasion.

Bevel or flare the ends in accordance with the manufacturer's recommendations. Locate a depth mark with a pencil or crayon to assure the spigot end is inserted to the recommended depth.

Remove burrs and wipe off all dust and dirt from the jointing surfaces and remove cuttings from interior of pipe or tubing.

Jointing the Pipe and Tubing

Joints in underground pipelines shall be gasket or solvent cement.

Joints in pipe or tubing shall be made in accordance with manufacturer's recommendations for specific method used.

Perform all jointing operations in accordance with manufacturer's printed instructions.

Gasketed Joints - Remove all dirt and foreign material from the spigot and bell end gasket and gasket groove. Apply lubricant furnished by the pipe manufacturer to the spigot end of the pipe. Insert the spigot to the reference mark. Take care during jointing to avoid disturbing previously installed joints.

FIELD QUALITY CONTROL

Pipe Deflection (Underground Pipelines) - Mirror each section of underground pipe for vertical ring deflection. Maximum allowable ring deflection shall be 5% of the outside diameter.

CLEANING AND TESTING SANITARY SEWER LINES AND MANHOLES

Cleaning - After the lines have been laid and the trench backfilled, they shall be thoroughly cleaned. Laterals and truck lines shall be flushed by water to remove all foreign material. The scouring action shall be accomplished by hydraulic or jet cleaning. Other methods may be used upon approval of the Engineer. After the lines have been thoroughly cleaned, they shall be mirrored between all manholes for displacement.

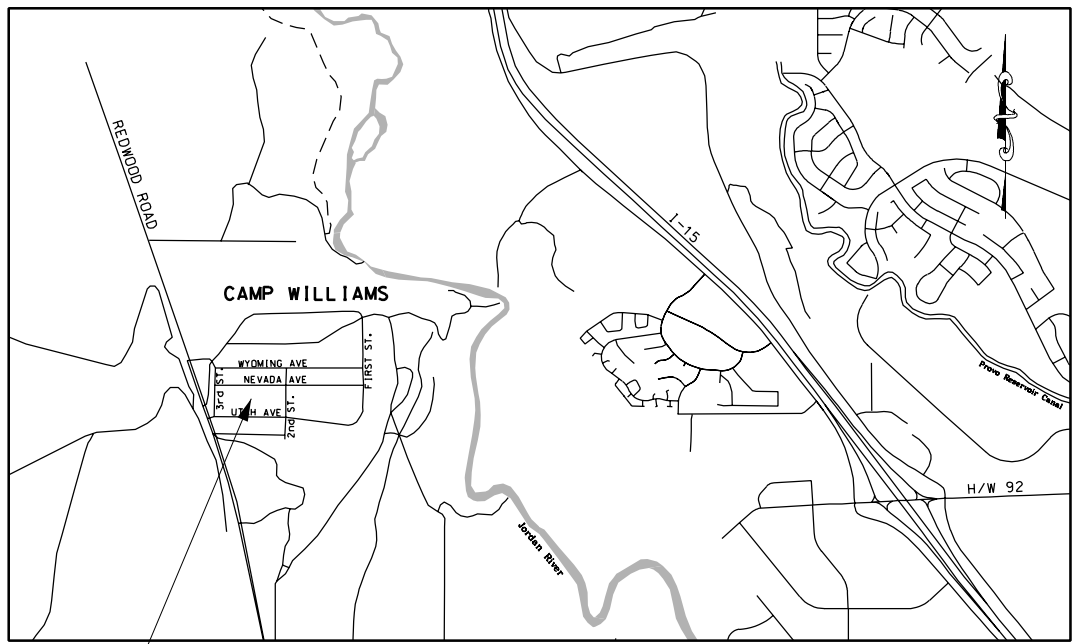
CONSTRUCTION DRAWINGS AND STANDARDS

UTAH NATIONAL GUARD - CAMP WILLIAMS
PECK FIELD GRADING AND DRAINAGE

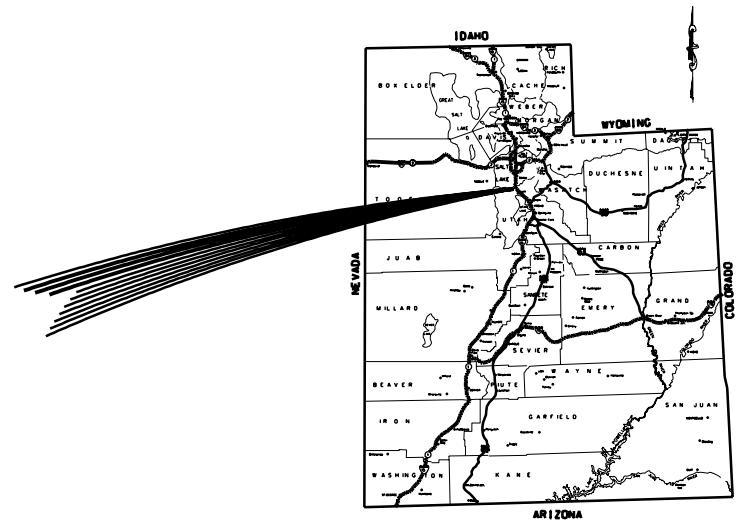
AUGUST 2005

SHEET INDEX

SHEET	DESCRIPTION
1	TITLE SHEET
2	GRADING SHEET

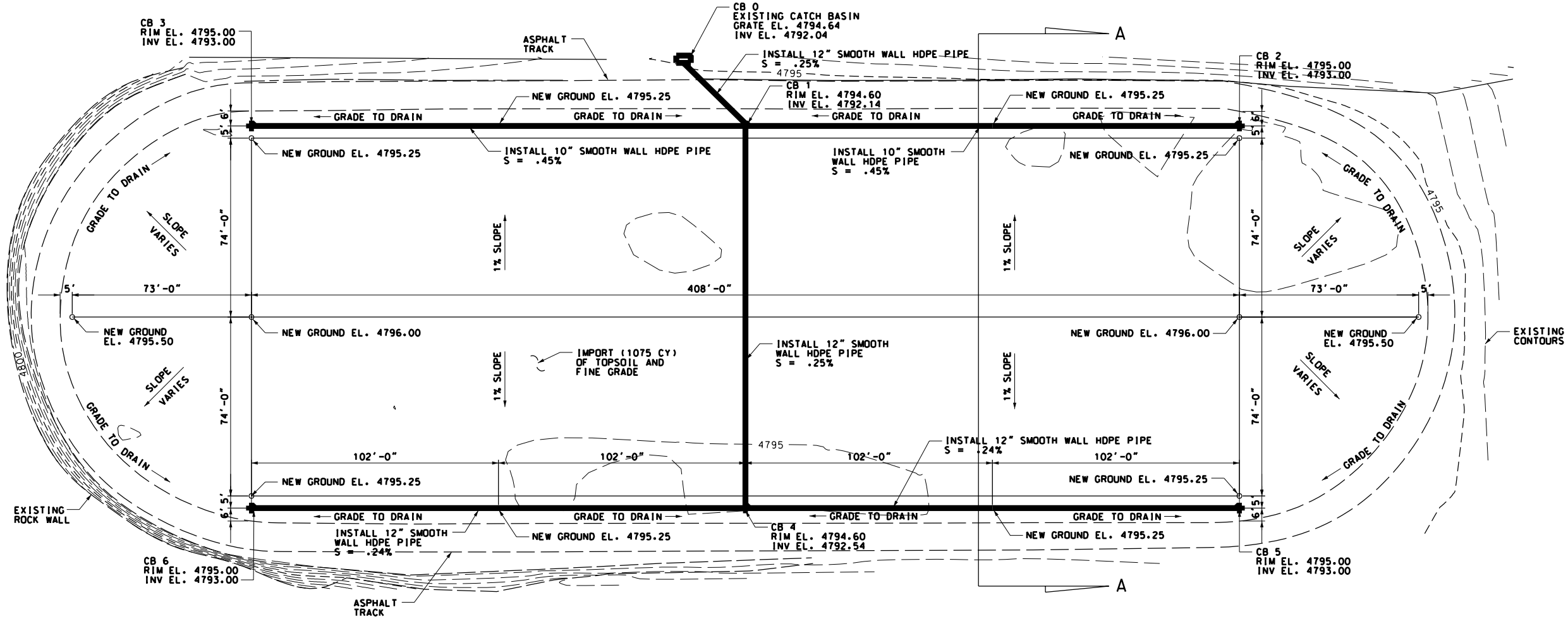


VICINITY MAP



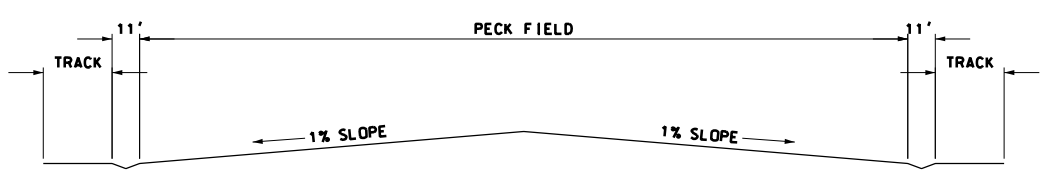
CIVIL SCIENCE
ENGINEERS - SURVEYORS - PLANNERS - SCIENTISTS
768 East Utah Valley Drive
American Fork, Ut. 84003
(801) 756-8888

SCALE: 1" = 50'



NOTE:

1. LOCATE AND ADJUST EXISTING SPRINKLER SYSTEM TO GRADE.
2. HYRO-SEED NEW GRASS
3. CATCH BASIN GRATE AND FRAME: D&L SUPPLY NO. I-9214 OR EQUAL. POWDER COAT GRATE GREEN PER CAMP WILLIAMS PERSONNEL
4. CONSTRUCT CONCRETE CATCH BASIN (TO MATCH GRATE AND FRAME SIZE)
5. USE CB 0 AS A REFERENCE ELEVATION.



SECTION A-A

SCALE	1" = 50'
DRAWN	TA
CHECKED	RME
APPROVED	JFM
DATE	AUG 05
PROJECT NO.	03131-07

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